IN THE CLAIMS:

Please cancel Claims 20-23, 26, and 27 without prejudice or disclaimer of the subject matter recited therein.

Please amend Claims 28, 29, 31, and 32 as follows.

Claims 1-27 (Cancelled).

Claim 28. (Currently Amended) An image processing apparatus ~~according to Claim 20,~~ comprising:

a read-out unit which reads out a photoelectric conversion signal accumulated in a pixel during a first accumulation duration, wherein the photoelectric conversion signal includes a first noise component;

an operation unit which calculates a noise correction value corresponding to the first noise component by using a correction value corresponding to a second noise component accumulated in the pixel during a second accumulation duration, and by using a correction value corresponding to a third noise component accumulated in the pixel during a third accumulation duration, wherein said noise correction value is calculated on the basis of changes in the first, second and third accumulation durations, and changes between the first, second and third noise components accumulated in the pixel, and wherein the first, second and third accumulation durations are different from each other; and

a correction unit correcting the photoelectric conversion signal using the correction value corresponding to the first noise component,

wherein said read-out unit reads out a photoelectric conversion signal accumulated in a pixel during a first accumulation duration in response to a sensor accumulation completion signal from a sensor representing the pixel, and

wherein said operation unit calculates a noise correction value corresponding to the first and second noise components by using correction values corresponding to second and third noise components accumulated in the pixel during second and third accumulation durations, which are both set by a timer independently of the sensor accumulation completion signal.

Claim 29. (Currently Amended) An image processing apparatus ~~according to Claim 20,~~ comprising:

a read-out unit which reads out a photoelectric conversion signal accumulated in a pixel during a first accumulation duration, wherein the photoelectric conversion signal includes a first noise component;

an operation unit which calculates a noise correction value corresponding to the first noise component by using a correction value corresponding to a second noise component accumulated in the pixel during a second accumulation duration, and by using a correction value corresponding to a third noise component accumulated in the pixel during a third accumulation duration, wherein said noise correction value is calculated on the basis of changes in the first, second and third accumulation durations, and changes between the first, second and third noise components accumulated in the pixel, and wherein the first, second and third accumulation durations are different from each other; and

a correction unit correcting the photoelectric conversion signal using the correction value corresponding to the first noise component,

wherein the second noise component comprises a fixed pattern noise component whose value is independent of the second accumulation duration and whose correction value is calculated from a value of the photoelectric conversion signal accumulated in the pixel during the second accumulation duration without modifying said value with a value of the second accumulation duration, and

wherein the third noise component comprises a dark current noise component whose value is dependent upon the third accumulation duration and whose correction value calculated from a value of the photoelectric conversion signal accumulated in the pixel during the third accumulation duration by modifying the value of the photoelectric conversion signal accumulated in the pixel during the third accumulation duration using the value of the third accumulation duration.

Claim 30. (Previously Presented) An image processing apparatus according to Claim 29,

wherein said operation unit calculates the noise correction value corresponding to the first noise component by using:

a fixed pattern noise correction value, FPN[i,j] for the jth pixel in an ith pixel train, corresponding to a second noise component accumulated in the pixel during a second accumulation duration, and

a dark current noise correction value corresponding to a third noise component accumulated in the pixel during a third accumulation duration, wherein the dark current noise correction value for the jth pixel of the ith pixel train is calculated by multiplying dark current correction information for the jth pixel of the ith pixel train, DK[i,j] by the third accumulation duration for the ith pixel train, TM[,I],

wherein said noise correction value, AD3[i,j] for the jth pixel of the ith pixel train is computed by first subtracting the fixed pattern noise correction value for the jth pixel of the ith pixel train, FPN [i,j], from the value of the read out photoelectric conversion signal read by said read-out unit for the jth pixel in the ith pixel train to obtain a fixed-pattern-noise-corrected photoelectric conversion signal AD2[i,j], and then subtracting the product of the dark pattern noise correction information for the jth pixel of the ith pixel train,DK [i,j] and the third accumulation duration for the ith pixel train TM[i], from the fixed-pattern-noise-corrected photoelectric conversion signalAD2[i,j] using the following two equations:

$$AD2\ [i,j] = AD[i,j] - FPN\ [i,j],$$

and

$$AD3\ [i,j] = AD2[i,j] - DK\ [i,j] \times TM[i].$$

Claim 31. (Currently Amended) An image processing apparatus ~~according to Claim 23,~~ comprising:

a read-out unit which reads out a photoelectric conversion signal accumulated in a pixel during a first accumulation duration, wherein the photoelectric conversion signal includes a first noise component;

an operation unit which calculates a noise correction value corresponding to the first noise component by using a correction value corresponding to fixed pattern noise of a plurality of pixels, and by using a correction value corresponding to a second noise component accumulated in the pixel during a second accumulation duration, wherein said noise correction value is calculated on the basis of changes between the first and second accumulation durations, and changes in the first and second noise components accumulated in the pixel, and wherein the first and second accumulation durations are different from each other; and

a correction unit correcting the photoelectric conversion signal using the correction value corresponding to the first noise component,

wherein said read-out unit reads out a photoelectric conversion signal accumulated in a pixel during a first accumulation duration in response to a sensor accumulation completion signal from a sensor representing the pixel, and

wherein said operation unit calculates a noise correction value corresponding to the first and second noise components by using a correction value corresponding to the second noise component accumulated in the pixel during second accumulation duration, which is set by a timer independently of the sensor accumulation completion signal.

Claim 32. (Currently Amended) An image processing apparatus ~~according to Claim 23,~~ comprising:

a read-out unit which reads out a photoelectric conversion signal accumulated in a pixel during a first accumulation duration, wherein the photoelectric conversion signal includes a first noise component;

an operation unit which calculates a noise correction value corresponding to the first noise component by using a correction value corresponding to fixed pattern noise of a plurality of pixels, and by using a correction value corresponding to a second noise component accumulated in the pixel during a second accumulation duration, wherein said noise correction value is calculated on the basis of changes between the first and second accumulation durations, and changes in the first and second noise components accumulated in the pixel, and wherein the first and second accumulation durations are different from each other; and

a correction unit correcting the photoelectric conversion signal using the correction value corresponding to the first noise component,

wherein the fixed pattern noise has a value that is independent of the accumulation duration associated with its measurement, wherein the correction value corresponding to the fixed pattern noise is calculated from a value of the photoelectric conversion signal accumulated in the pixel during the accumulation duration associated with the measurement of the fixed pattern noise without modifying said value with a value of its associated accumulation duration, and

wherein the second noise component comprises a dark current noise component whose value is dependent upon the second accumulation duration and whose correction value calculated from a value of the photoelectric conversion signal accumulated in the pixel during the second accumulation duration by modifying the value of the photoelectric conversion signal accumulated in the pixel during the second accumulation duration using the value of the second accumulation duration.

Claim 33. (Previously Presented) An image processing apparatus according to Claim 32,

wherein said operation unit calculates the noise correction value corresponding to the first noise component by using:

a fixed pattern noise correction value, FPN[i,j] for the jth pixel in an ith pixel train, which is accumulated in the pixel its associated accumulation duration, and

a dark current noise correction value corresponding to the second noise component accumulated in the pixel during the second accumulation duration, wherein the dark current noise correction value for the jth pixel of the ith pixel train is calculated by multiplying dark current correction information for the jth pixel of the ith pixel train, DK[i,j] by the second accumulation duration for the ith pixel train, TM[,I],

wherein said noise correction value, AD3[i,j] for the jth pixel of the ith pixel train is computed by first subtracting the fixed pattern noise correction value for the jth pixel of the ith pixel train, FPN [i,j], from the value of the read out photoelectric conversion signal read by said read-out unit for the jth pixel in the ith pixel train to obtain a fixed-pattern-noise-

corrected photoelectric conversion signal AD2[i,j], and then subtracting the product of the dark pattern noise correction information for the jth pixel of the ith pixel train,DK [i,j] and the second accumulation duration for the ith pixel train TM[i], from the fixed-pattern-noise-corrected photoelectric conversion signalAD2[i,j] using the following two equations:

$$AD2\ [i,j] = AD[i,j] - FPN\ [i,j],$$

and

$$AD3\ [i,j] = AD2[i,j] - DK\ [i,j] \times TM[i].$$